

Lessons From Joplin



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A photograph of a highway interchange. A large concrete overpass with a metal guardrail spans the road. Below the overpass, a green rectangular sign with rounded corners and a white border reads "CITY LIMIT Joplin" in white capital letters. To the left of this sign, a blue shield-shaped sign with a white border displays the number "44" in white, and below it, a green rectangular sign with a white border displays "MILE 13.2" in white. The road is a multi-lane highway with a concrete barrier on the left and a grassy embankment on the right. Several vehicles are visible in the distance on the highway. The sky is clear and blue.

CITY LIMIT
Joplin

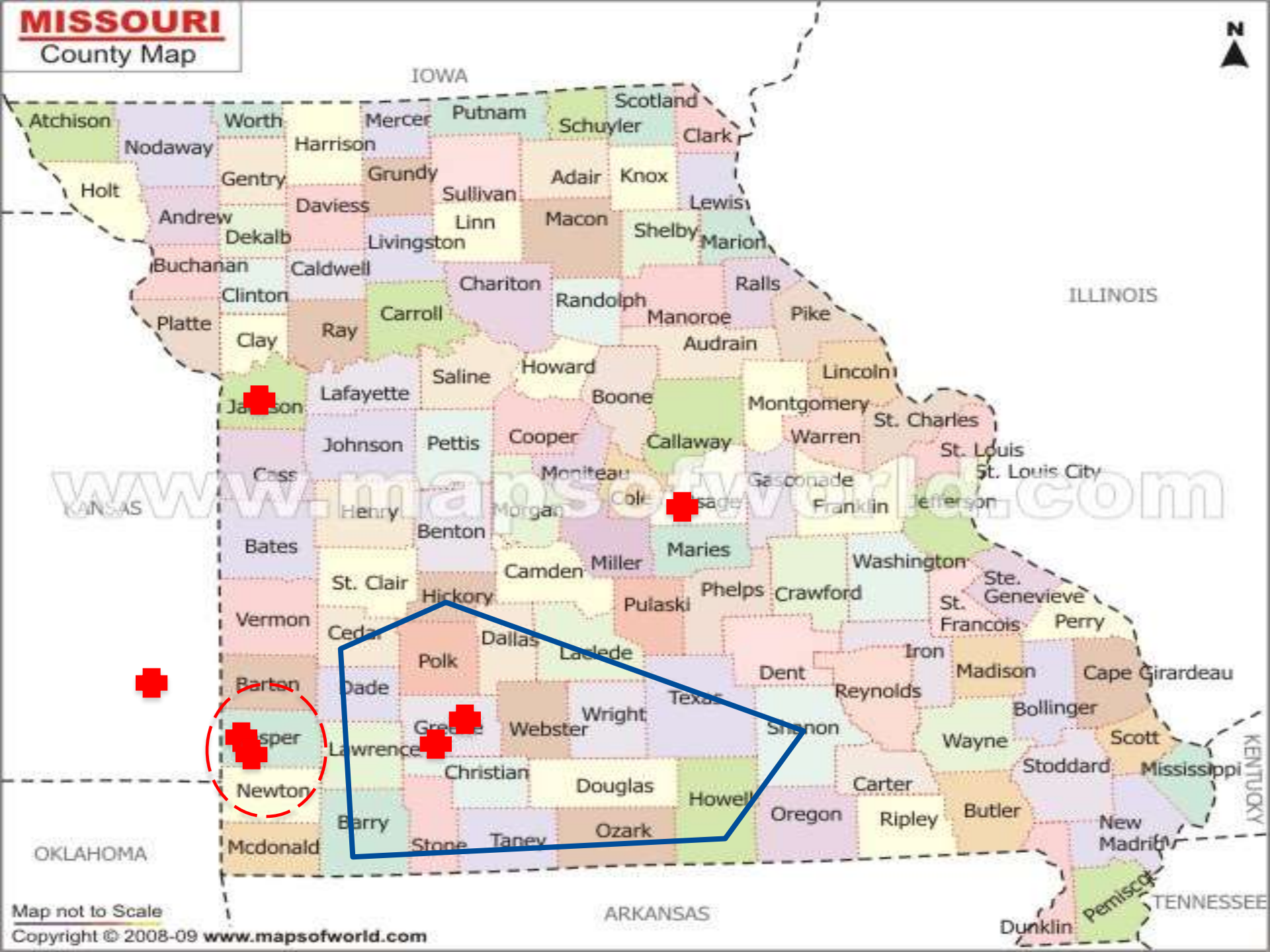
44
MILE
13
.2

Background

- Borders AR, KS and OK
- Joplin Population: 50K, 270K and 400K
- In tornado alley
- 3 Colleges
- 2 Hospitals
 - Freeman
 - Mercy

MISSOURI

County Map



www.mapsofworld.com



Freeman ER

- A normal day in the ED:
 - 41 beds in 4 pods
 - 12 RNs; 4 Physicians; 5 Nurse Techs; 4 Unit Secretaries
 - Average 130 patients seen per day
 - EMS/FIRE
 - METS: Jasper County (20K)
 - Newton County EMS

Sunday, May 22, 2011



Time Line

- Tornado Watch 1440
 - Conditions favorable in parts of AR, KS, MO, and OK
- Storm chasers reported multiple vortices west of Joplin
- 1745 City/County officials begun cord with NWS to track tornado
- 1817 NWS issued tornado warning

- 1817 Sirens
- 1831 Sirens
- 1841 EF-5 Tornado touchdown with winds >200MPH
 - 22 miles long
 - 1 mile wide
 - Damage path was 6 miles

One mans story...

- Aware that storms were probably going to happen
- Noticed the weather changes outside
- Heard 1st Siren while driving to restaurant (30 min)
- Restaurant denied him entry
- Drove to 2nd restaurant (Business as usual)
- Noticed the weather changing
- Reports came from TV/Radio
- Patron indicated a tornado in Joplin
- Management instructed protective action

- This resident stated that he perceived the threat as real during 4/5
- Stated he didn't want to be in his car
- Threat was diminished when second business was carrying on as "normal"

Individuals perception of threat





Figure 4: Track of Joplin Tornado. (Source: NWS)

Source: FEMA's Joplin, MO, Tornado Lessons Learned Study



Damage Done

- 161 Lives lost
 - 54% in homes
 - 32% in non-residential
 - 14% Outside/Cars
- 1370 Injuries
 - Deadliest tornado since 1947
 - 7th Deadliest in History
- 944 Pets rescued
 - 297 returned to owners

Damage Done

- 8000 Homes destroyed/damaged
- 2000 Buildings
 - 2 Fire stations
 - Home Depot/Lowes
 - High School/Elementary/Middle Schools
 - Churches
- 16,000 cars/trucks destroyed









HOPE
HIGH SCHOOL



High School Graduation

















**FOR
RENT**

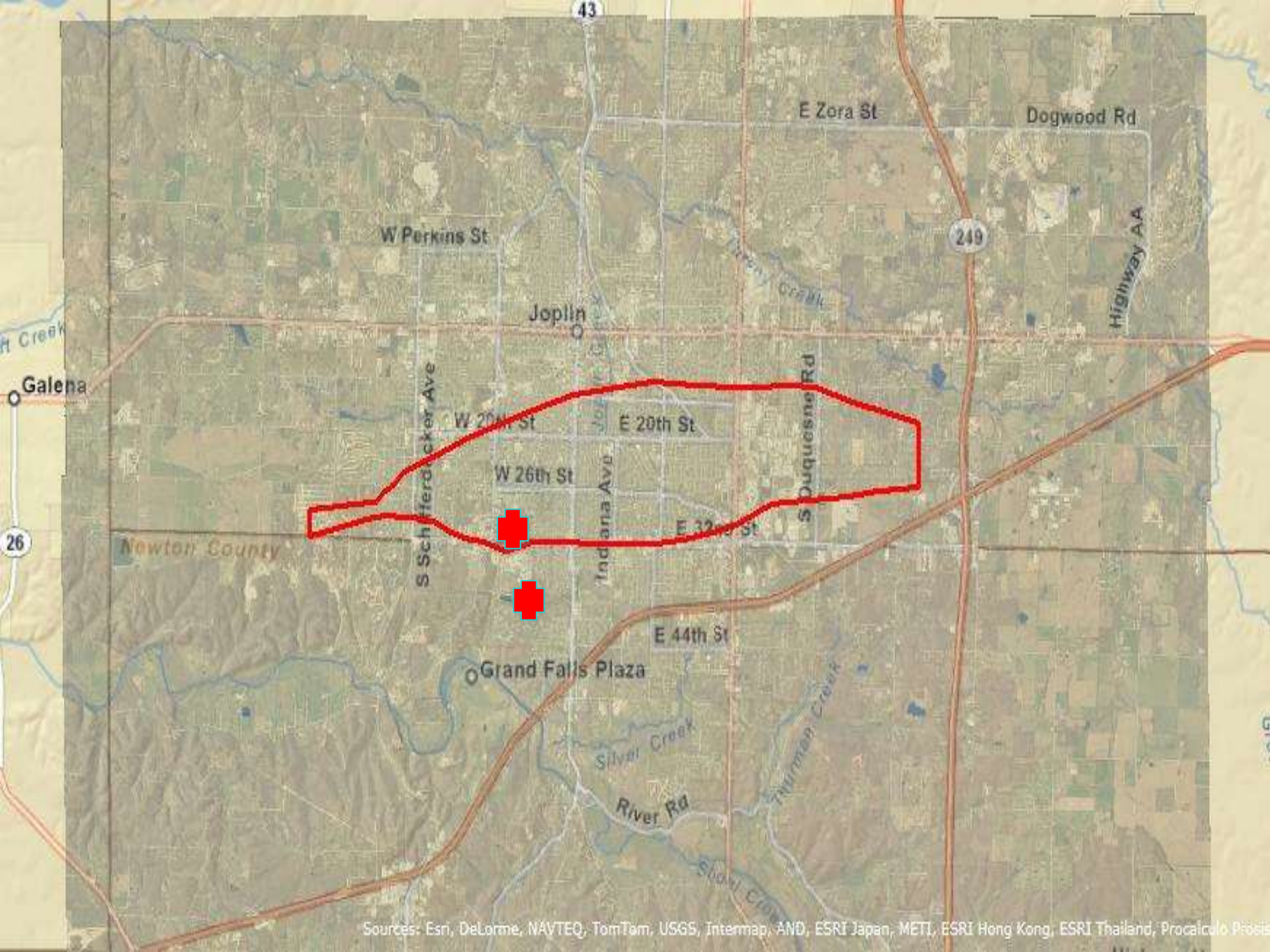
Details in Front Window





St. Johns/Mercy Med Center

- Direct hit
 - Windows/Walls
 - Roof ripped off
 - Infrastructure destroyed
 - Generators, water, sprinkler, gas/sewer pipes
 - Liquid O2
 - Massive debris
 - HIPPA















- 185 Patients in the hospital
 - 1 Surgery in progress
 - 1 Patient in PACU
 - 24 Patients were in the ER
 - 28 in ICU
- Staff stories

St. Johns/Mercy

- Where did the patients go and how did they get there?
- Parking lot triage operations
- Patients kept coming

Patients
everywhere!!”

Mercy to Freeman



- Physician arrival
- Nursing response
- All critical care beds filled
- Not enough vents – nurses manually bagging patients in recovery area
- 22 major surgeries in the first 12 hours
- 1200 patients in first 24-36 hours



Medical Damage

- Nursing home next to hospital
- 86 medical staff members offices
- Rehab Center
- Disaster trailer destroyed















Mass Casualty Incident

- Casualty load exceeds the surge capacity of a single institution
- Typical trauma center routine trauma response envelope is 4-5 critically injured patients arriving simultaneously
- Dependent upon capacity of 5 key facilities:
 - ED, OR, ICU, blood bank, emergency laboratory
- 10-20% of patients in MCI will be critical

Minimal Acceptable Care

- 65% of casualties of war survive one week without any medical care
- Principles:
 - empirical splinting of suspected fractures without imaging
 - Fluid hydration and empiric antibiotics for penetrating abdominal trauma with peritoneal signs but hemodynamically stable
- Philosophy- reserve access to CT scanner for patients whose scan is absolutely essential or potentially life saving

Triage

- Everything from severely injured to “walking wounded”
- Patients arriving at all entrances meant multiple triage areas
 - Depletion of normal resources (I.D., charts, etc.)





John Doe

femur fracture

FAST ⊖

lab drawn

Ⓛ pneumothorax.

08/15/2011

- Not enough supplies!

- Sutures / Staplers
 - Chest tubes
 - Medications
 - Blankets / Linen
 - Manual blood pressure cuffs
- (Mercy Equipment)

- Lack of Security

- Families searching for family members



SPRINGFIELD RESPONSE



FIRST STEP



STRIKE TEAM RESPONSE

- 2 HOURS FROM TORNADO TOUCHDOWN
- 12 EMS UNITS IN JOPLIN
- OBSTACLES:
 - NO COMMUNICATION
 - HOW TO SAFELY GET TO SITES



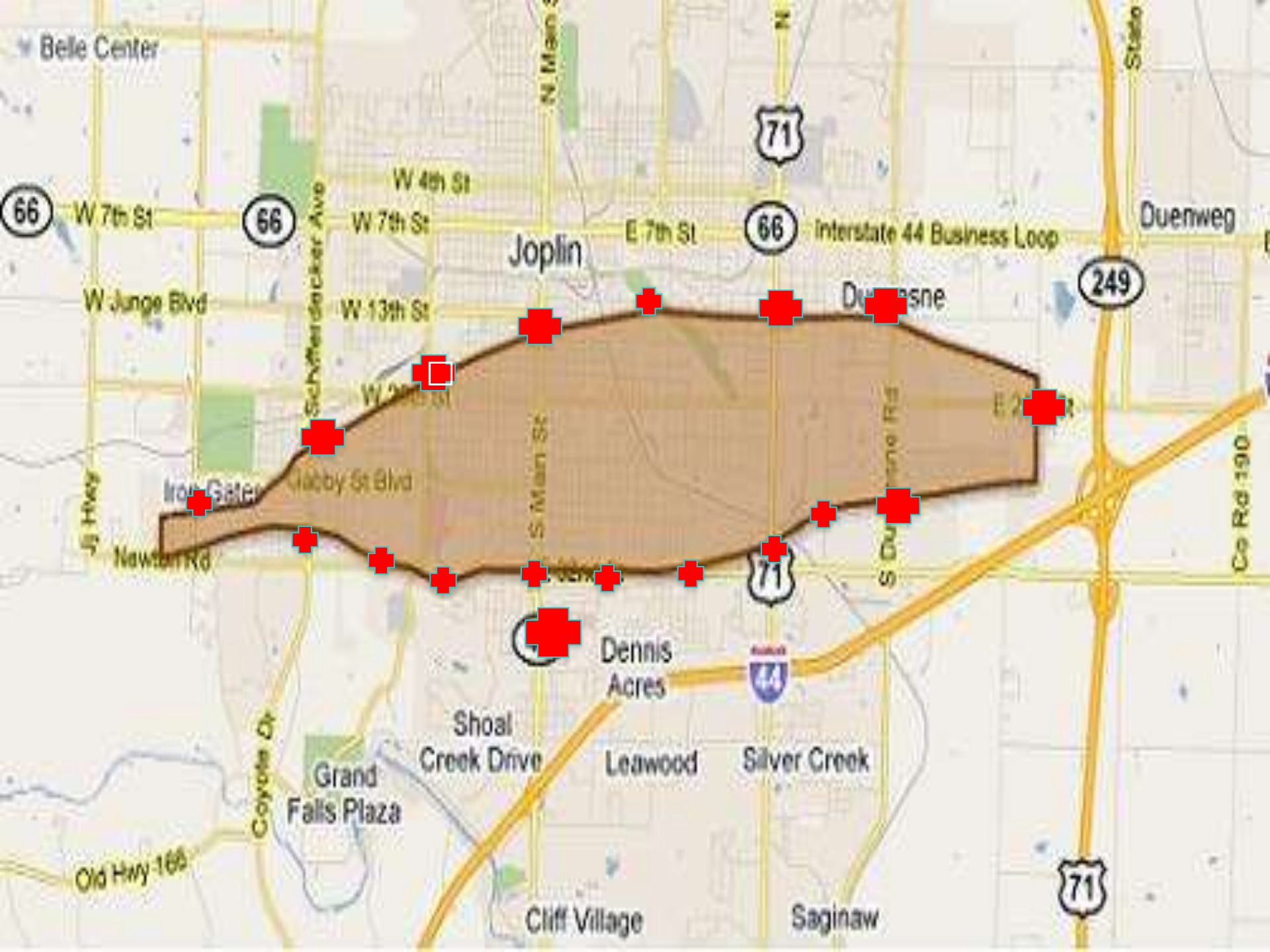
TRIAGE SITES

- GO AS FAR AS THEY COULD...
- "WAR ZONE"
- "ZOMBIES"
- Lights draw them out..

LESSON LEARNED.... TAKE YOUR KEYS

Transporting

- Transporting to Springfield
 - Communication through word of mouth
- Utilization of field triage locations throughout the city
 - Memorial Hall
 - Home Depot (Parking Lot)
 - Lowes (Parking Lot)



WALKING WOUNDED..

SCHOOL BUS WAS SENT TO
SPRINGFIELD WITH 35-40
“WALKING WOUNDED” TO
COX NORTH

Aircraft Utilization

- 13 Aircraft
- Communication issues
 - Logistics (Fuel, duty time, crew quarters, etc.)
 - Safety(LZ locations, collision avoidance, auto launch)
 - Utilization

Challenges for EMS

- Ongoing weather conditions
- Crowd control - traffic
- Pharmacy Recovery
- Safety and Security
- Dignitary Visits





Situational Awareness

- Magnitude of the event
- Landmarks not recognizable
- Mapping important
- GPS devices and smart phones
- Spray paint street names on curbs











Post-traumatic Mucormycosis

- 18 suspected and 13 confirmed cases according to CDC analysis
- Infection implicated as a contributing factor of fatality in 5 patients
- First outbreak following a tornado, although similar outbreak occurred following the March tsunami in Japan
- Further CDC research underway to elicit etiology

What drills won't prepare you for

- Reality of the importance the community has on your ability to provide care during disasters
- Try having drill and remove your leadership from the scenario
- Flood of issues that all come at once
- Physical and emotional pain of the patients
- The stories

It can be WHO you know

- Electric district ran a new main feed line to hosp and power was restored in 13 hours
 - Construction contractor contacted and within the hour, a crew of 15 with a semi load of generators and telescopic lights
- Pharmacy directors for meds
- Freeman pathologist for blood



Communication







Photo: American Red Cross

WHAT DID WE LEARN

- Early warning system
 - Weather radios, warning sirens
 - Emails
 - Text messages
 - Social media
 - Injury Prevention
- Promote and incentivize safe rooms and storm shelters
- After the media leaves
- Rest
- When to pull back





FOR SALE

- Pool in basement
- Fully furnished
- Large sunroom
- FIRM on price

Update Joplin 2014/2015



- 90% Homes rebuilt
- 95% Business rebuilt
- You can rent a car again...
- Not all good
 - Child abuse
 - Domestic violence
 - Drugs/Alcohol use in students
 - PTSD
 - 1400 mental health cases

Questions ???

